Dam Safety In Washington

Jurisdiction of Dam Safety in Washington

The preponderance of responsibility for ensuring dam safety in Washington State falls to the Washington State Department of Ecology, Dam Safety Office. By statute, a dam is an artificial barrier that can or does impound more than 10 acre-feet of water. There are over 1,000 dams in the state that meet this criteria. State and Federal agencies are responsible for ensuring that citizens are safe from failing dams, and dams meet safety standards.

Figure 1 – Jurisdiction for Dams in Washington

Agency of Jurisdiction	Number of Washington State Dams
U.S. Army Corps of Engineers	19
U.S. Bureau of Reclamation	35
Other Federal	15
Federal Energy Regulatory Commission (non-Federal hydropower dams)	76
Washington Department of Ecology	870
Total of dams	1015

Characteristics of Dams in Washington

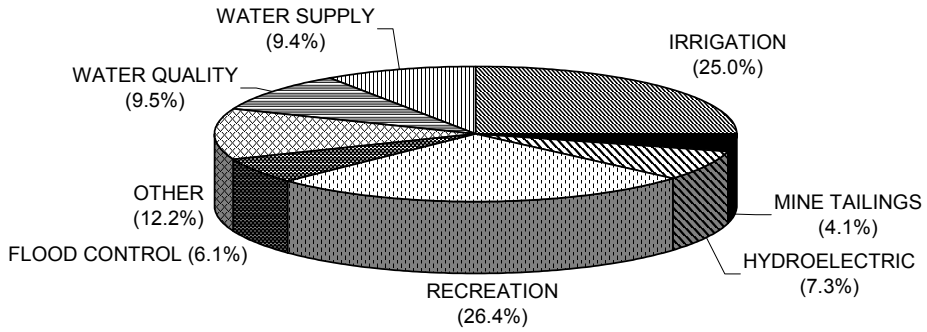
There are currently 870 dams in the State of Washington that are regulated by the Dam Safety Office (DSO). This number continues to increase as 10 to 15 new dams are constructed each year. About 306 (35%) of the 870 dams under Ecology jurisdiction are located above populated areas, and are therefore classified as having high or significant downstream hazards. This number also continues to increase as new dams are built and development continues to occur downstream of existing dams. Most of the dams regulated by the department fall into the small and medium size categories, as shown in Figure 2.

Number of Dams by Height/Hazard, Regulated by Dam Safety Office

Height of Dam / Hazard	< 15 feet	15-49 feet	>50 feet
High (7 or more population at risk)	**36**	**66**	**17**
Significant (1 to 6 population at risk)	**78**	**97**	**12**
Low (0 population at risk)	**402**	**157**	**4**
Totals	**516**	**320**	**33**

These dams have been built for a variety of purposes including: irrigation water supply; domestic water supply; recreation; waste water treatment or storage; flood control; mine tailings storage; and hydropower production. While irrigation and recreation currently account for the majority of facilities, dams have been built for a wide range of purposes (Figure 3). This diversity in project purposes in combination with the many geologic and hydrologic settings found in the state poses a variety of operational and engineering design considerations.

FIGURE 3
TYPES OF DAMS
UNDER ECOLOGY JURISDICTION



Ensuring that Dams are Safe

The authority and responsibility to regulate dams in Washington and to provide for public safety is contained in the following laws:

- State Water Code (1917) - Chapter 90.03 RCW
- Flood Control Act (1935) - Chapter 86.16 RCW
- Department of Ecology (1970) - Chapter 43.21A RCW

Where water projects involve dams and reservoirs with a storage volume of 10 acre-feet or more, provisions were made in the laws for the engineering review of the construction plans and specifications, for the inspection of dams, and for requiring remedial action, as necessary, to reasonably secure proper operation, maintenance, and continued safe performance. As part of its administrative charge, the Ecology Dam Safety Office is the agency of state government vested with the authority and responsibility to perform these functions.

Plan Review & Approval

To reasonably assure adequacy of design, engineering design reports, and construction plans and specifications for dams and appurtenant works are examined and approved in accordance with statutory requirements and accepted engineering practice. Plan review is required for all projects with an impounding capability of 10 acre-feet or more at the dam crest level. A Construction Permit is issued when the construction plans and specifications, and Construction Inspection Plan have been found to be acceptable and upon payment of applicable plan review fees. Copies of all approved plans are retained on file in the DSO office.

Construction Inspection

Construction inspections are performed to verify that the field conditions encountered are compatible with the conditions assumed in design and that the construction is proceeding in accordance with the approved plans, specifications, and construction inspection plan. Particular emphasis is placed on observing and documenting the construction of elements which are critical to the safe performance of the facility. The frequency of DSO site inspections are commensurate with the size and complexity of the project.

Periodic Inspections

Periodic inspections are conducted on existing dams that are located in areas where dam failure and release of the reservoir contents could pose the potential for loss of life. The inspections are intended to identify deficiencies, and to reasonably assure safe operation and confirm that maintenance is being adequately performed. The frequency of inspections is laid out in Water Resources Program Policy 5404.

The inspections are performed by professional engineers from the DSO and involve: a detailed inspection of all features of the project; engineering analysis of critical project elements under extreme flood and earthquake loadings; and preparation of a comprehensive report of the findings. This report includes a detailed description of the analyses, findings from the inspection, and any required remedial work to be performed.

Compliance and Enforcement

Enforcement actions are taken as necessary to secure compliance with safety requirements and to correct identified deficiencies. The compliance and enforcement activity involves a variety of possible actions including restrictions on reservoir operation, draining of the reservoir, assessment of fines, and court actions. When a dam owner is not responsive in correcting deficiencies, the dam may be declared a public nuisance and removed through an abatement proceeding in Superior Court.

Records and Inventory

Records of all activities associated with a project, including design reports, plans and specifications, inspection reports, and correspondence, are retained on file with the DSS. As a basic source of information on the physical characteristics of projects, a computerized inventory is maintained in the Dam Safety office for all dams in the state. This computerized inventory is housed on a server in the Lacey HQ building, and is linked to the agency's Facility-Site database. A listing of all dams in the state was last published in 1994. This publication, *Inventory of Dams in the State of Washington, Publication 94-16*, is available upon request from the Dam Safety Office. In addition, a GIS coverage is available from Ecology GIS services. Contact John Tooley at (360) 407-6418 for assistance on obtaining the GIS coverage.